Leading the Way: Comprehensive EMS Launched at Ann Arbor Facility

NVFEL's facilities in Ann Arbor, Michigan.

The U.S. Environmental Protection Agency's (EPA) National Vehicle and Fuel Emissions Laboratory (NVFEL) in Ann Arbor, Michigan, has a mission to align the transportation sector with the environment by advancing clean fuels and technology and promoting more livable communities. As a way of living out its mission, NVFEL showed leadership in the federal community by not only self-declaring its comprehensive EMS in August 2005, six months earlier than was required by Executive Order (E.O.) 13148, but also by achieving ISO 14001 certification in March 2006. ISO 14001, an internationally recognized best practice framework for developing an EMS, involves a cyclical four-step process to sound environmental management—*act, plan, do, check*. By closely following this recognized EMS standard, NVFEL has proven its commitment to the health of its staff and the environment. In only one year, the facility has decreased its energy consumption by 20 billion British thermal units (Btus) and water use by more than 2.5 million gallons (see table below). EPA is proud to nominate the National Vehicle and Fuel Emissions Laboratory for the 2007 White House Closing the Circle Environmental Management Systems Award.

2005 Consumption		2006 Consumption	
Energy (BTUs)	Water (gallons)	Energy (BTUs)	Water (gallons)
74,501,978,400	10,007,494	56,556,943,660	7,415,439

By focusing on improvements to its energy savings performance contract and other EMS targets, NVFEL saw a drastic decrease in the amount of energy and water consumed at its facilities in 2006.

A Leader in the Agency and Beyond

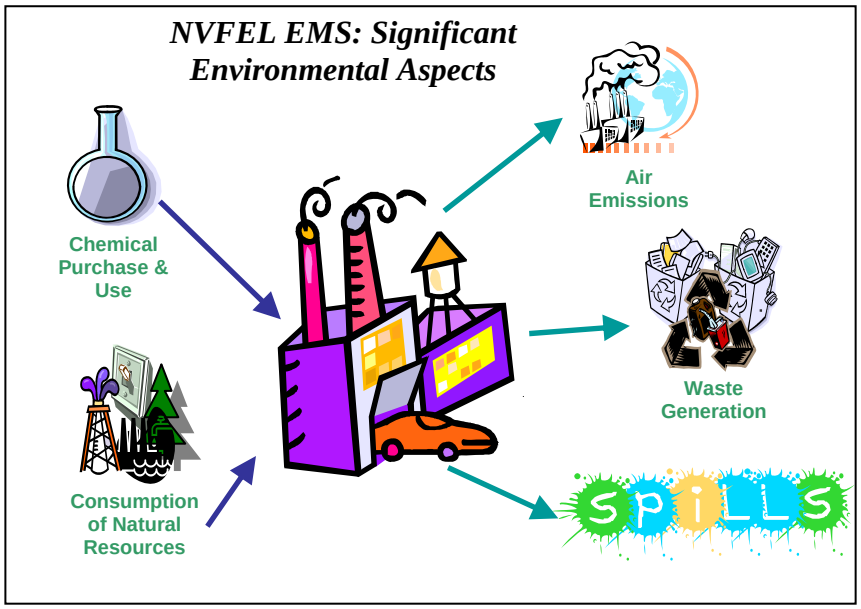
While many federal facilities have implemented EMSs in accordance with E.O. 13148, relatively few have taken the additional step or have incurred the cost of subjecting the system to a review from an accredited ISO 14001 auditor. Out of 34 EPA facilities, only two others have received ISO 14001 certification. NVFEL achieved certification through a three-step process in which an auditor reviewed the detailed EMS manual and procedures and thoroughly questioned all levels of staff at the facility on the plan, including administrators, laboratory technicians, and contractors. During ISO's first audit, only one person was unable to answer one of the auditor's questions about the EMS. While extensive, this audit was only the first; two additional reviews occur each year after achieving certification.

ISO 14001 is an environmental management standard created by the International Organization for Standardization (ISO). Achieving this standard helps an organization minimize its operation's negative impact on their environment, comply with laws, regulations, and environmentally-oriented mandates, and continually improve its performance.

Under the ISO 14001 framework, NVFEL identified five aspects of its work that impact the environment and developed a separate management program for improving performance for each aspect. NVFEL is unique among EPA facilities because of the nature of the research performed there—primarily fuel and emissions testing on mobile sources of pollution, such as cars, trucks, and boats. For this reason, the facility's EMS highlights the following aspects: accidental releases, chemical purchase and use, air emissions, waste generation, and consumption of natural resources (water, energy, and materials).

Fiver Aspects with Aggressive Targets

Within those five aspects, NVFEL developed 16 objectives and 35 specific targets, all with a focus on life cycle assessment, environmental performance of products, and design and development for the environment. The objectives for each aspect require that, at the very least, the facility maintains compliance with federal, state, and local regulations and continues to promote employee awareness through education and outreach materials. Highlights of the success of NVFEL's EMS in 2006 are listed below.



The diagram above shows NVFEL's five significant environmental aspects within its EMS

Accidental Releases ("Spills")

As part of its target to control 100 percent of accidental releases to the environment, NVFEL completed a review of its hydraulic testing activities in May 2006 and since then has addressed 9 of the 10 findings. In addition, the Spill Prevention Control and Countermeasures (SPCC) Plan was signed in January, and only two spill incidents occurred in 2006.

Each employee is required to take an initial spill prevention overview training at the beginning of his or her tenure. In 2006, the Emergency Response Team and other key employees who work with the most hazardous substances attended a Hazardous Spill Response Training (22 people). Also, members of the Emergency Response team attended a Lab Alarm Systems training and Emergency Response Plan review to reinforce the important operating procedures to follow during dangerous spills.

Chemical Purchase and Use

Each year NVFEL is required by its EMS to reduce the use of priority chemicals in equipment by 25 percent. In 2006, NVFEL safely removed from its facilities:

- 8.9 pounds of lead (with no additional purchases of lead in 2006)
- 4 pounds of mercury
- 1,199 pounds of fluorescent lamps (containing mercury)

In addition, to comply with government regulations, NVFEL submitted its Emergency Planning and Community Right-to-Know Report showing that, in 2006, there were no material releases requiring notification to state or local authorities. This success is linked to the initial onsite training for all employees at which the Chemical Hygiene Plan is introduced, covering the proper purchase, use, handling, and disposal of chemicals.

Air Emissions

To regulate and reduce greenhouse gas and particulate matter releases, protective collars were installed on all of the facility's gas cylinders in storage. The Gas Laboratory also completed installation of valve guards on secondary gas cylinders. Training for six new employees working with compressed gas cylinders was offered in 2006. Also, in July a diesel exhaust scrubber system was commissioned. As part of the government compliance for air emissions, NVFEL submitted the Annual Renewal Registration Limiting Potential to Emit Report on time to the Michigan Department of Environmental Quality (DEQ). All of these actions help keep NVFEL in line with its EMS and maintain emissions levels that are well under the levels permitted by the Michigan DEQ.

Waste Generation

NVFEL has seen a great decrease in the amount of materials disposed of due to its objective to develop and maintain waste reduction and recycling programs. EMS awareness e-mails, bulletins, and meetings discussing the recycling programs have helped the facility collect various materials, from paper to computer accessories. As required by its EMS, NVFEL is exploring new ways to decrease waste. In 2005, NVFEL looked into the recycling of polystyrene or molded foam and computer media (floppy disks, compact discs, and DVDs) in 2006. While monetary, space, and security constraints have prevented NVFEL from adding these materials to its list of recyclables, it is still exploring alternative options.

Recycling at NVFEL in 2006

- 23.3 tons of paper
- 25.2 tons of cardboard
- 40.3 tons of scrap metal
- 874 pounds of dry-cell batteries
- 875 gallons of used oil
- 91 gallons of solvents
- 3,150 pounds of absorbents
- 351 computer monitors
- 414 computers and accessories
- 6000 pieces of small electronics

Recycling more materials will not only decrease waste, it will decrease disposal costs. Taxpayer cost savings has been one of the most measurable benefits of adopting an ISO certified EMS. In 2006, NVFEL estimated it avoided $6,300 in disposal costs by recycling scrap metals and $12,000 by switching to reusable absorbents for cleaning up laboratory facilities and chemical and oil spills.

Consumption of Natural Resources

As EPS's seventh largest facility, NVFEL consumes a large amount of energy. However, working with its energy provider, NVFEL has decreased its consumption by nearly 20 billion BTUs in one year by monitoring the HVAC system and lighting during non-working hours. In addition, NVFEL has successfully upheld its target of using no water for irrigation by using alternate methods to maintain a healthy landscape.

To maintain fuel conservation efforts, NVFEL reduced its fleet size from four to three vehicles in 2006, with one a gas/electric hybrid and two E85 flex fuel vehicles, which run on a blend of ethanol and gasoline. Ann Arbor Transit Authority bus tokens are provided to employees and help NVFEL maintain its standing as a Best Workplace for Commuters.

In addition, NVFEL has adopted a policy of informing its vendors, suppliers, and contractors of the safety, health, and environmental requirements of the facility, and encourages them to comply with similar policies at their locations. Those vendors that operate with sound safety, health, and environmental principles will be favored by NVFEL in the purchase of all products—from office supplies to laboratory chemicals. Also, office supply reuse programs are in place in the laboratory and office spaces, encouraging all employees to reuse materials.

Monitoring for Ongoing Performance

A large portion of the "check" incorporated into NVFEL's EMS is the continual monitoring of environmental and system performance. In addition to the bi-annual audits by ISO, NVFEL subjects itself to:

- Incident reviews performed per occurrence
- Weekly hazardous waste inspections by the Safety Office
- Bi-monthly gas cylinder inspections
- Monthly SPCC inspections by the Safety Office
- Semi-annual Chemical Hygiene Plan (CHP) inspections performed by group managers with assistance from the Safety Office
- Annual reviews of NVFEL Standard Operating Procedures

These reviews and inspections are used to connect the last stage of the ISO 14001 EMS back to the beginning. If an auditor of any kind finds an issue with the system, the EMS team can return to the original plan and revised their actions based on these experiences. In addition, once a month a member of the EMS team attends group and division meetings to update personnel on the system, to answer informal questions, and to receive feedback on how the EMS is performing for employees.

With each review or inspection, NVFEL improves its facility's environmental performance. EPA hopes that the example that NVFEL has set will serve as a model for other federal facilities, providing the influence to take that extra step to environmental management and safety.

EPA would like to recognize the following employees for the success of NVFEL's EMS: Christopher Grundler, Michael Sabourin, Fidel Galano, Gregory Sturgell, Mary Caldwell, Steven Dorer, and Ruth Schenk.